SEQUENCE LISTING

<110> Shaw, Jei-Fu
Lee, Guan-Chiun
Tang, Shye-Jye

<120> RECOMBINANT CANDIDA RUGOSA LIPASES

<130> 08919-066001

<140> 09/943,857
<141> 2001-08-31

<160> 11

<170> FastSEQ for Windows Version 4.0

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<212> DNA
<213> Candida rugosa

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tccacgtgag catgaactac cgcgtggcgt catgggggtt cttggccggc cccgacatcc 420
agaacgaagg cagcgggaac gccggcttgc atgaccagcg cttggccatg cagtgggtgg 480
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cgcccggcgt gttggcgtac ccgtcgttgc ggttgtatct cccgcggccc gacggcacct 840
tcatcaccga cgacatgtat gccttggtgc gggacggcaa gtacgcacac gtgccggtga 900
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<210> 2
<211> 547
<212> PRT
<213> Candida rugosa

<400> 2

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            20                  25                  30
Asn Gln Lys Phe Leu Gly Ile Pro Phe Ala Glu Pro Pro Val Gly Ser
        35                  40                  45
Leu Arg Phe Lys Pro Pro Val Pro Tyr Ser Ala Ser Leu Asn Gly Gln
    50                  55                  60
Gln Phe Thr Ser Tyr Gly Pro Ser Cys Met Gln Met Asn Pro Met Gly
65                  70                  75                  80
Ser Phe Glu Asp Thr Leu Pro Lys Asn Ala Leu Asp Leu Val Leu Gln
                85                  90                  95
Ser Lys Ile Phe Gln Val Val Leu Pro Asn Asp Glu Asp Cys Leu Thr
            100                 105                 110
Ile Asn Val Ile Arg Pro Pro Gly Thr Arg Ala Ser Ala Gly Leu Pro
        115                 120                 125
Val Met Leu Trp Ile Phe Gly Gly Gly Phe Glu Leu Gly Gly Ser Ser
    130                 135                 140
Leu Phe Pro Gly Asp Gln Met Val Ala Lys Ser Val Leu Met Gly Lys
145                 150                 155                 160
Pro Val Ile His Val Ser Met Asn Tyr Arg Val Ala Ser Trp Gly Phe
                165                 170                 175
Leu Ala Gly Pro Asp Ile Gln Asn Glu Gly Ser Gly Asn Ala Gly Leu
            180                 185                 190
His Asp Gln Arg Leu Ala Met Gln Trp Val Ala Asp Asn Ile Ala Gly
        195                 200                 205
Phe Gly Gly Asp Pro Ser Lys Val Thr Ile Tyr Gly Glu Ser Ala Gly
    210                 215                 220
Ser Met Ser Thr Phe Val His Leu Val Trp Asn Asp Gly Asp Asn Thr
225                 230                 235                 240
Tyr Asn Gly Lys Pro Leu Phe Arg Ala Ala Ile Met Gln Ser Gly Cys
                245                 250                 255
Met Val Pro Ser Asp Pro Val Asp Gly Thr Tyr Gly Thr Glu Ile Tyr
            260                 265                 270
Asn Gln Val Val Ala Ser Ala Gly Cys Gly Ser Ala Ser Asp Lys Leu
        275                 280                 285
Ala Cys Leu Arg Gly Leu Ser Gln Asp Thr Leu Tyr Gln Ala Thr Ser
    290                 295                 300
Asp Thr Pro Gly Val Leu Ala Tyr Pro Ser Leu Arg Leu Ser Tyr Leu
305                 310                 315                 320
Pro Arg Pro Asp Gly Thr Phe Ile Thr Asp Asp Met Tyr Ala Leu Val
                325                 330                 335
Arg Asp Gly Lys Tyr Ala His Val Pro Val Ile Ile Gly Asp Gln Asn
            340                 345                 350
Asp Glu Gly Thr Leu Phe Gly Leu Ser Ser Leu Asn Val Thr Thr Asp
        355                 360                 365
Ala Gln Ala Arg Ala Tyr Phe Lys Gln Ser Phe Ile His Ala Ser Asp
    370                 375                 380
Ala Glu Ile Asp Thr Leu Met Ala Ala Tyr Thr Ser Asp Ile Thr Gln
385                 390                 395                 400
Gly Ser Pro Phe Asp Thr Gly Ile Phe Asn Ala Ile Thr Pro Gln Phe
                405                 410                 415
Lys Arg Ile Ser Ala Leu Leu Gly Asp Leu Ala Phe Thr Leu Ala Arg
            420                 425                 430
Arg Tyr Phe Leu Asn Tyr Tyr Gln Gly Gly Thr Lys Tyr Ser Phe Leu
        435                 440                 445
Ser Lys Gln Leu Ser Gly Leu Pro Val Leu Gly Thr Phe His Gly Asn
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    450                 455                 460
Asp Leu Ile Trp Gln Asp Tyr Leu Val Gly Ser Gly Ser Val Ile Tyr
465                 470                 475                 480
Asn Asn Ala Phe Ile Ala Phe Ala Asn Asp Leu Asp Pro Asn Lys Ala
                485                 490                 495
Gly Leu Trp Thr Asn Trp Pro Thr Tyr Thr Ser Ser Ser Gln Ser Gly
            500                 505                 510
Asn Asn Leu Met Gln Ile Asn Gly Leu Gly Leu Tyr Thr Gly Lys Asp
        515                 520                 525
Asn Phe Arg Pro Asp Ala Tyr Ser Ala Leu Phe Ser Asn Pro Pro Ser
    530                 535                 540
Phe Phe Val
545
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<210> 3
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<212> DNA
<213> Candida rugosa

<400> 3

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tgtgccgtac tctggctcgc tcaacggcca gaagttactt acggcccgtg catgcagcag     180
aacccgagg gcacgtttga agagaacctt ggcaagacgg cactcgactt ggtgatgcag      240
tccaaggtgt tccaggcggt gcttccccag agtgaggact gcctcaccat caacgtggtg     300
cggccgccgg gcaccaaggc gggcgccaac ctcccggtca tgctctggat ctttggcggt     360
gggtttgaga tcggcagccc caccatcttc cctcccgccc agatggtcac caagagtgtg     420
ctcatgggca agccatcatc cacgtggccg tcaactaccg tgttgcctcg tgggggttct     480
tggctggtga tgacatcaag gccgagggca gcgggaacgc cggcttgaag gaccagcgtt     540
tgggcatgca gtgggtggca gacaacattg ccgggttcgg cggcgacccg agcaaggtga     600
catctttggc gaggcgggca gcatgtccgt gttgtgccac ctcatctgga acgacggcga     660
caacacgtac aagggcaagc cgttgttccg cgcgggcatc atgcagggag ccatggtgcc     720
ggacccggtg gacggcacgt acggcaacga gatctacgac ctctttgtct cgagtgctgg     780
ctgtggcagc gccagcgaca agctcgcgtg cttgcgcagt gcgagcgaca ccttgctcga     840
tgccaccaac aacactcctg ggttcttggc gtactcctcg ttgcggttgt actcccggcc     900
cgacggcaag aacatcaccg atgacatgta caagttggtg cgcgacggca agtatgcaag     960
cgttcccgtg atcattggcg accagaacga cgagggcacc atctttggct cttgaacgtg    1020
accacgaatg ctcaggcccg tgcttacttc aagcagttca tccacgccag cgacgcggag    1080
atcgacacct tgatggcggc gtacccccag gacatcaccc agggtccgtt cgacacggtt    1140
caacgctcac cccgcagttc aagagaatcg cggtgctcgg cgaccttgca ttcatccacg    1200
cccgccgcta cttcctcaac cacttccagg gcggcaccaa gtactcgttc ctcaagcagc    1260
tcgggttgcc aatcatgggc accttccatg ccaacgacat tgtgtggcag gactacttgt    1320
tgggaagcgg cagcgtcatc tacaacaacg cgtttatcgc gttcgccacc gacttggacc    1380
ccaacaccgc ggggttgttg gtgaactggc ccaagtacac cagcagccag ggcaacaact    1440
tgatgatgat caacgccttg ggcttgtaca ccggcaagga caacttccgc accgctggct    1500
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<210> 4
<211> 547
<212> PRT
<213> Candida rugosa

<400> 4

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Ala Lys Leu Ala Asn Gly Asp Thr Ile Thr Gly Leu Asn Ala Ile Ile
            20                  25                  30
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Asn Glu Arg Phe Leu Gly Ile Pro Phe Ala Glu Pro Pro Val Gly Asn
                                40                  45
Leu Arg Phe Lys Asp Pro Val Pro Tyr Ser Gly Ser Leu Asn Gly Gln
            50                  55                  60
Lys Phe Thr Ser Tyr Gly Pro Ser Cys Met Gln Gln Asn Pro Glu Gly
65                  70                  75                  80
Thr Phe Glu Glu Asn Leu Gly Lys Thr Ala Leu Asp Leu Val Met Gln
                85                  90                  95
Ser Lys Val Phe Gln Ala Val Leu Pro Gln Ser Glu Asp Cys Leu Thr
            100                 105                 110
Ile Asn Val Val Arg Pro Pro Gly Thr Lys Ala Gly Ala Asn Leu Pro
        115                 120                 125
Val Met Leu Trp Ile Phe Gly Gly Gly Phe Glu Ile Gly Ser Pro Thr
    130                 135                 140
Ile Phe Pro Pro Ala Gln Met Val Thr Lys Ser Val Leu Met Gly Lys
145                 150                 155                 160
His Ile Ile His Val Ala Val Asn Tyr Arg Val Ala Ser Trp Gly Phe
                165                 170                 175
Leu Ala Gly Asp Asp Ile Lys Ala Glu Gly Ser Gly Asn Ala Gly Leu
            180                 185                 190
Lys Asp Gln Arg Leu Gly Met Gln Trp Val Ala Asp Asn Ile Ala Gly
        195                 200                 205
Phe Gly Gly Asp Pro Ser Lys Val Thr Ile Phe Gly Glu Ser Ala Gly
    210                 215                 220
Ser Met Ser Val Leu Cys His Leu Ile Trp Asn Asp Gly Asp Asn Thr
225                 230                 235                 240
Tyr Lys Gly Lys Pro Leu Phe Arg Ala Gly Ile Met Gln Ser Gly Ala
                245                 250                 255
Met Val Pro Ser Asp Pro Val Asp Gly Thr Tyr Gly Asn Glu Ile Tyr
            260                 265                 270
Asp Leu Phe Val Ser Ser Ala Gly Cys Gly Ser Ala Ser Asp Lys Leu
        275                 280                 285
Ala Cys Leu Arg Ser Ala Ser Ser Asp Thr Leu Leu Asp Ala Thr Asn
    290                 295                 300
Asn Thr Pro Gly Phe Leu Ala Tyr Ser Ser Leu Arg Leu Ser Tyr Leu
305                 310                 315                 320
Pro Arg Pro Asp Gly Lys Asn Ile Thr Asp Asp Met Tyr Lys Leu Val
                325                 330                 335
Arg Asp Gly Lys Tyr Ala Ser Val Pro Val Ile Ile Gly Asp Gln Asn
            340                 345                 350
Asp Glu Gly Thr Ile Phe Gly Leu Ser Ser Leu Asn Val Thr Thr Asn
        355                 360                 365
Ala Gln Ala Arg Ala Tyr Phe Lys Gln Ser Phe Ile His Ala Ser Asp
    370                 375                 380
Ala Glu Ile Asp Thr Leu Met Ala Ala Tyr Pro Gln Asp Ile Thr Gln
385                 390                 395                 400
Gly Ser Pro Phe Asp Thr Gly Val Leu Asn Ala Leu Thr Pro Gln Phe
                405                 410                 415
Lys Arg Ile Ser Ala Val Leu Gly Asp Leu Ala Phe Ile His Ala Arg
            420                 425                 430
Arg Tyr Phe Leu Asn His Phe Gln Gly Gly Thr Lys Tyr Ser Phe Leu
        435                 440                 445
Ser Lys Gln Leu Ser Gly Leu Pro Ile Met Gly Thr Phe His Ala Asn
    450                 455                 460
Asp Ile Val Trp Gln Asp Tyr Leu Leu Gly Ser Gly Ser Val Ile Tyr
465                 470                 475                 480
Asn Asn Ala Phe Ile Ala Phe Ala Thr Asp Leu Asp Pro Asn Thr Ala
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```
                485                 490                 495
Gly Leu Leu Val Asn Trp Pro Lys Tyr Thr Ser Ser Ser Gln Ser Gly
            500                 505                 510
Asn Asn Leu Met Met Ile Asn Ala Leu Gly Leu Tyr Thr Gly Lys Asp
        515                 520                 525
Asn Phe Arg Thr Ala Gly Tyr Asp Ala Leu Met Thr Asn Pro Ser Ser
    530                 535                 540
Phe Phe Val
545
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<210> 5
<211> 1548
<212> DNA
<213> Candida rugosa

<400> 5

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tgtgccgtac tcggcgtctc tcaatggtca gaagtttact gtatggccct gtgcatgcag     180
atgaacccat tgggcaactg ggactcctcg cttcccaagg ctgccatcaa cttgatgcag     240
tccaagctct tccaggcggt gcttcctaac ggcgaggact gtctcaccat caacgtggtg     300
cggccgggca ccaagccggg tgccaacctc cccgtgatgg tgtggatttt tggcggcggg     360
tttgaggttg gcggctccag tctcttccct cccgcacaga tgatcaccgc cagcgtgctt     420
atgggcaagc ccatcatcca cgtgagcatg aactaccgcg ttgcttcgtg ggggttcttg     480
gctggtccag acatcaaggc cgagggcagc gggaacgccg gtttgcacga ccaacgcttg     540
ggtttgcagt gggtggcgga caacattgcc gggttcggcg gcgacccgtc caaggtgacc     600
atctttggtg agggcgggca gcatgtcggt aatgtgtcag ctcctctgga acgacggcga     660
caacacgtac aacggcaagc cgttgttccg tgccgccatc atgcaggggg ccatggtgcc     720
gggacccggt ggatgggccc tacggcacgc agatctacga ccaggtggtt gcttcagccg     780
gctgtggcag tgccagcgac aagctcgcgt gcttgcgcag catcgaacga caaactcttc     840
caggccacca gcgacactcc gggggccttg gcgtaccgct cgttgcggtt ggtttctccc     900
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tgccaacgtt ccggtgatca ttggcgacca gaacgacgag ggcacagtgt ttgcgttgtt    1020
gaacgtgact acggatgctc aggcacgcca gtacttcaag gaattcatcc acgccagcga    1080
cgcggagatc gacaccttga tggcggcgta ccccagcgac atcacccagg gtccgttcga    1140
caccggcatc ttcaacgcca tcaccccgca gttcaaacgg attgcagcgg tgcttggtga    1200
ccttgcgttc actctccccc ggcgctactt cctcaaccac ttccagggcg gcaccaagta    1260
ctcgttcctc gaagcagctt gggttgccgg tgattggcac ccaccacgcc aacgacattg    1320
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ttgccaacga cctcgacccg aacaaggccg gtttgcttgt gaactggccc aagtacacca    1440
gcagccaggg caacaacttg ttgcagatca acgccttggg cttgtacacc ggcaaggaca    1500
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<210> 6
<211> 547
<212> PRT
<213> Candida rugosa

<400> 6

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Ala Thr Leu Ala Asn Gly Asp Thr Ile Thr Gly Leu Asn Ala Ile Ile
            20                  25                  30
Asn Glu Ala Phe Leu Gly Ile Pro Phe Ala Gln Pro Pro Val Gly Asn
        35                  40                  45
Leu Arg Phe Lys Pro Pro Val Pro Tyr Ser Ala Ser Leu Asn Gly Gln
    50                  55                  60
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```
Lys Phe Thr Ser Tyr Gly Pro Ser Tyr Met Gln Met Asn Pro Leu Gly
65                  70                  75                  80
Asn Trp Asp Ser Ser Leu Pro Lys Ala Ala Ile Asn Ser Leu Met Gln
                85                  90                  95
Ser Lys Leu Phe Gln Ala Val Leu Pro Asn Gly Glu Asp Cys Leu Thr
            100                 105                 110
Ile Asn Val Val Arg Pro Ser Gly Thr Lys Pro Gly Ala Asn Leu Pro
        115                 120                 125
Val Met Val Trp Ile Phe Gly Gly Gly Phe Glu Val Gly Gly Ser Ser
    130                 135                 140
Leu Phe Pro Pro Ala Gln Met Ile Thr Ala Ser Val Leu Met Gly Lys
145                 150                 155                 160
Pro Ile Ile His Val Ser Met Asn Tyr Arg Val Ala Ser Trp Gly Phe
                165                 170                 175
Leu Ala Gly Pro Asp Ile Lys Ala Glu Gly Ser Gly Asn Ala Gly Leu
            180                 185                 190
His Asp Gln Arg Leu Gly Leu Gln Trp Val Ala Asp Asn Ile Ala Gly
        195                 200                 205
Phe Gly Gly Asp Pro Ser Lys Val Thr Ile Phe Gly Glu Ser Ala Gly
    210                 215                 220
Ser Met Ser Val Met Cys Gln Leu Leu Trp Asn Asp Gly Asp Asn Thr
225                 230                 235                 240
Tyr Asn Gly Lys Pro Leu Phe Arg Ala Ala Ile Met Gln Ser Gly Ala
                245                 250                 255
Met Val Pro Ser Asp Pro Val Asp Gly Pro Tyr Gly Thr Gln Ile Tyr
            260                 265                 270
Asp Gln Val Val Ala Ser Ala Gly Cys Gly Ser Ala Ser Asp Lys Leu
        275                 280                 285
Ala Cys Leu Arg Ser Ile Ser Asn Asp Lys Leu Phe Gln Ala Thr Ser
    290                 295                 300
Asp Thr Pro Gly Ala Leu Ala Tyr Pro Ser Leu Arg Leu Ser Phe Leu
305                 310                 315                 320
Pro Arg Pro Asp Gly Thr Phe Ile Thr Asp Asp Met Phe Lys Leu Val
                325                 330                 335
Arg Asp Gly Lys Cys Ala Asn Val Pro Val Ile Ile Gly Asp Gln Asn
            340                 345                 350
Asp Glu Gly Thr Val Phe Ala Leu Ser Ser Leu Asn Val Thr Thr Asp
        355                 360                 365
Ala Gln Ala Arg Gln Tyr Phe Lys Glu Ser Phe Ile His Ala Ser Asp
    370                 375                 380
Ala Glu Ile Asp Thr Leu Met Ala Ala Tyr Pro Ser Asp Ile Thr Gln
385                 390                 395                 400
Gly Ser Pro Phe Asp Thr Gly Ile Phe Asn Ala Ile Thr Pro Gln Phe
                405                 410                 415
Lys Arg Ile Ala Ala Val Leu Gly Asp Leu Ala Phe Thr Leu Pro Arg
            420                 425                 430
Arg Tyr Phe Leu Asn His Phe Gln Gly Gly Thr Lys Tyr Ser Phe Leu
        435                 440                 445
Ser Lys Gln Leu Ser Gly Leu Pro Val Ile Gly Thr His His Ala Asn
    450                 455                 460
Asp Ile Val Trp Gln Asp Phe Leu Val Ser His Ser Ser Ala Val Tyr
465                 470                 475                 480
Asn Asn Ala Phe Ile Ala Phe Ala Asn Asp Leu Asp Pro Asn Lys Ala
                485                 490                 495
Gly Leu Leu Val Asn Trp Pro Lys Tyr Thr Ser Ser Ser Gln Ser Gly
            500                 505                 510
Asn Asn Leu Leu Gln Ile Asn Ala Leu Gly Leu Tyr Thr Gly Lys Asp
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Asn Phe Arg Thr Ala Gly Tyr Asp Ala Leu Phe Thr Asn Pro Ser Ser
    530                 535                 540
Phe Phe Val
545
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<210> 7
<211> 1541
<212> DNA
<213> Candida rugosa

<400> 7

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gtgccgtacc gtgggtctct caacggtcaa tccttcaccg cgtacggtcc gtgcatgcag     180
cagaaccccg agggcaccta cgaggagaac ctccccaagg tggcgcttga cttggtgatg     240
cagtccaagg tgttccaggc tgttctcccc aacagcgagg actgcctcac catcaacgtg     300
gtgcggccgc cgggcaccaa ggcgggcgcc aacctccccg tcatgctctg gatctttggc     360
ggtgggtttg agatcggcag ccccaccatc ttccctcccg ctcagatggt gtccaagagt     420
gtgctcatgg gcagcccatc atccacgtgg ccgtcaacta ccgcttggcg tcctttggtt     480
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gcttgggcat gcagtgggtg gcagacaaca ttgccgggtt cggcggcgac ccgagcaagg     600
tgaccatctt tgggaggcgg gcagcatgtc cgtgttgtgc caccttctct ggaatggcgg     660
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gccggacccg gtggacggca cctatggacc caaatctatg acacgttggt ggctacgggc     780
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<210> 8
<211> 547
<212> PRT
<213> Candida rugosa

<400> 8

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Ser Met Asn Ser Arg Gly Pro Ala Gly Arg Leu Gly Ser Val Pro Thr
 1               5                  10                  15
Ala Thr Leu Ala Asn Gly Asp Thr Ile Thr Gly Leu Asn Ala Ile Ile
            20                  25                  30
Asn Glu Ala Phe Leu Gly Ile Pro Phe Ala Glu Pro Pro Val Gly Asn
        35                  40                  45
Leu Arg Phe Lys Asp Pro Val Pro Tyr Arg Gly Ser Leu Asn Gly Gln
    50                  55                  60
Ser Phe Thr Ala Tyr Gly Pro Ser Cys Met Gln Gln Asn Pro Glu Gly
65                  70                  75                  80
Thr Tyr Glu Glu Asn Leu Pro Lys Val Ala Leu Asp Leu Val Met Gln
                85                  90                  95
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```
Ser Lys Val Phe Gln Ala Val Leu Pro Asn Ser Glu Asp Cys Leu Thr
            100                 105                 110
Ile Asn Val Val Arg Pro Pro Gly Thr Lys Ala Gly Ala Asn Leu Pro
        115                 120                 125
Val Met Leu Trp Ile Phe Gly Gly Gly Phe Glu Ile Gly Ser Pro Thr
    130                 135                 140
Ile Pro Pro Pro Ala Gln Met Val Ser Lys Ser Val Leu Met Gly Glu
145                 150                 155                 160
Pro Ile Ile His Val Ala Val Asn Tyr Arg Leu Ala Ser Phe Gly Phe
                165                 170                 175
Leu Ala Gly Pro Asp Ile Lys Ala Glu Gly Ser Ser Asn Ala Gly Leu
            180                 185                 190
Lys Asp Gln Arg Leu Gly Met Gln Trp Val Ala Asp Asn Ile Ala Gly
        195                 200                 205
Phe Gly Gly Asp Pro Ser Lys Val Thr Ile Phe Gly Glu Ser Ala Gly
    210                 215                 220
Ser Met Ser Val Leu Cys His Leu Leu Trp Asn Gly Gly Asp Asn Thr
225                 230                 235                 240
Tyr Lys Gly Lys Pro Leu Phe Arg Ala Gly Ile Met Gln Ser Gly Ala
                245                 250                 255
Met Val Pro Ser Asp Pro Val Asp Gly Thr Tyr Gly Ala Gln Ile Tyr
            260                 265                 270
Asp Thr Leu Val Ala Ser Thr Gly Cys Ser Ser Ala Ser Asn Lys Leu
        275                 280                 285
Ala Cys Leu Arg Gly Leu Ser Thr Gln Ala Leu Leu Asp Ala Thr Asn
    290                 295                 300
Asp Thr Pro Gly Phe Leu Ser Tyr Thr Ser Leu Arg Leu Ser Tyr Leu
305                 310                 315                 320
Pro Arg Pro Asp Gly Ala Asn Ile Thr Asp Asp Met Tyr Lys Leu Val
                325                 330                 335
Arg Asp Gly Lys Tyr Ala Ser Val Pro Val Ile Ile Gly Asp Gln Asn
            340                 345                 350
Asp Glu Gly Phe Leu Phe Asp Leu Ser Ser Leu Asn Thr Thr Thr Glu
        355                 360                 365
Ala Asp Ala Glu Ala Tyr Leu Arg Lys Ser Phe Ile His Ala Thr Asp
    370                 375                 380
Ala Asp Ile Thr Ala Leu Lys Ala Ala Tyr Pro Ser Asp Val Thr Gln
385                 390                 395                 400
Gly Ser Pro Phe Asp Thr Gly Ile Leu Asn Ala Leu Thr Pro Gln Leu
                405                 410                 415
Lys Arg Ile Asn Ala Val Leu Gly Asp Leu Thr Phe Thr Leu Ser Arg
            420                 425                 430
Arg Tyr Phe Leu Asn His Tyr Thr Gly Gly Pro Lys Tyr Ser Phe Leu
        435                 440                 445
Ser Lys Gln Leu Ser Gly Leu Pro Ile Leu Gly Thr Phe His Ala Asn
    450                 455                 460
Asp Ile Val Trp Gln His Phe Leu Leu Gly Ser Gly Ser Val Ile Tyr
465                 470                 475                 480
Asn Asn Ala Phe Ile Ala Phe Ala Thr Asp Leu Asp Pro Asn Thr Ala
                485                 490                 495
Gly Leu Ser Val Gln Trp Pro Lys Tyr Thr Ser Ser Ser Gln Ala Gly
            500                 505                 510
Asp Asn Leu Met Gln Ile Ser Ala Leu Gly Leu Tyr Thr Gly Lys Asp
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Asn Phe Arg Thr Ala Gly Tyr Asn Ala Leu Phe Ala Asp Pro Ser His
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Phe Phe Val
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545

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<212> DNA
<213> Candida rugosa

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<213> Candida rugosa

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Asn Glu Ala Phe Leu Gly Ile Pro Phe Ala Glu Pro Pro Val Gly Asn
        35   40   45
Leu Arg Phe Lys Asp Pro Val Pro Tyr Ser Gly Ser Leu Asp Gly Gln
    50   55   60
Lys Phe Thr Ser Tyr Gly Pro Ser Cys Met Gln Gln Asn Pro Glu Gly
65   70   75   80
Thr Tyr Glu Glu Asn Leu Pro Lys Ala Ala Leu Asp Leu Val Met Gln
                85   90   95
Ser Lys Val Phe Glu Ala Val Ser Pro Ser Ser Glu Asp Cys Leu Thr
            100   105   110
Ile Asn Val Val Arg Pro Pro Gly Thr Lys Ala Gly Ala Asn Leu Pro
        115   120   125

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Val Met Leu Trp Ile Phe Gly Gly Gly Phe Glu Val Gly Gly Thr Ser
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Thr Phe Pro Pro Ala Gln Met Ile Thr Lys Ser Ile Ala Met Gly Lys
145                 150                 155                 160
Pro Ile Ile His Val Ser Val Asn Tyr Arg Val Ser Ser Trp Gly Phe
                165                 170                 175
Leu Ala Gly Asp Glu Ile Lys Ala Glu Gly Ser Ala Asn Ala Gly Leu
            180                 185                 190
Lys Asp Gln Arg Met Gly Met Gln Trp Val Ala Asp Asn Ile Ala Ala
        195                 200                 205
Phe Gly Gly Asp Pro Thr Lys Val Thr Ile Phe Gly Glu Ser Ala Gly
    210                 215                 220
Ser Met Ser Val Met Cys His Ile Leu Trp Asn Asp Gly Asp Asn Thr
225                 230                 235                 240
Tyr Lys Gly Lys Pro Leu Phe Arg Ala Gly Ile Met Gln Ser Gly Ala
                245                 250                 255
Met Val Pro Ser Asp Ala Val Asp Gly Val Tyr Gly Asn Glu Ile Phe
            260                 265                 270
Asp Leu Leu Ala Ser Asp Ala Gly Cys Gly Ser Ala Ser Asp Lys Leu
        275                 280                 285
Ala Cys Leu Arg Gly Val Ser Ser Asp Thr Leu Glu Asp Ala Thr Asn
    290                 295                 300
Asn Thr Pro Gly Phe Leu Ala Tyr Ser Ser Leu Arg Leu Ser Tyr Leu
305                 310                 315                 320
Pro Arg Pro Asp Gly Val Asn Ile Thr Asp Asp Met Phe Ala Leu Val
                325                 330                 335
Arg Glu Gly Lys Tyr Ala Ser Val Pro Val Ile Ile Gly Asp Gln Asn
            340                 345                 350
Asp Glu Gly Thr Phe Phe Gly Thr Ser Ser Leu Asn Val Thr Thr Asp
        355                 360                 365
Ala Glu Ala Arg Gln Tyr Phe Thr Gln Ser Phe Val His Ala Ser Asp
    370                 375                 380
Ala Glu Leu Asp Thr Leu Met Thr Ala Tyr Pro Gln Asp Ile Thr Gln
385                 390                 395                 400
Gly Ser Pro Phe Asp Thr Gly Val Leu Asn Ala Leu Thr Pro Gln Phe
                405                 410                 415
Lys Arg Ile Ser Ala Val Leu Gly Asp Leu Ala Phe Ile His Ala Arg
            420                 425                 430
Arg Tyr Phe Leu Asn His Tyr Thr Gly Gly Thr Lys Tyr Ser Phe Leu
        435                 440                 445
Ser Lys Gln Leu Ser Gly Leu Pro Val Leu Gly Thr Phe His Ser Asn
    450                 455                 460
Asp Ile Val Phe Gln Asp Tyr Leu Leu Gly Ser Gly Ser Leu Ile Tyr
465                 470                 475                 480
Asn Asn Ala Phe Ile Ala Phe Ala Thr Asp Leu Asp Pro Asn Thr Ala
                485                 490                 495
Gly Leu Leu Val Lys Trp Pro Glu Tyr Thr Ser Ser Ser Gln Ser Gly
            500                 505                 510
Asn Asn Leu Met Met Ile Asn Ala Leu Gly Leu Tyr Thr Gly Lys Asp
        515                 520                 525
Asn Ser Arg Thr Ala Gly Tyr Asp Ala Leu Phe Ser Asn Pro Pro Ser
    530                 535                 540
Phe Phe Val
545
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(12) PRT
(13) Candida rugosa

(400) 11
Ser Met Asn Ser Arg Gly Pro Ala Gly Arg Leu Gly Ser
1 5 10